TABLE OF CONTENTS

ADVANCES IN PHYSIOLOGY EDUCATION

A CELEBRATION OF THE CENTENNIAL OF THE *AMERICAN JOURNAL OF PHYSIOLOGY*

This special section, edited by D. U. Silverthorn, features invited articles examining the future of physiology education.

PHYSIOLOGY EDUCATION TODAY: WHAT COMES NEXT? S1

D. U. Silverthorn

The author reviews recent changes and provides an overview of the future of physiology education.

A THEORETICAL FOUNDATION FOR DISCOVERY LEARNING S4

M. D. Svinicki

This article describes how cognitive learning theory supports the components of discovery learning and how this is changing the format of physiology education.

CURRENT AND FUTURE IMPACT OF TECHNOLOGY ON PHYSIOLOGY EDUCATION S8

R. G. Carroll

The author considers the evolving nature of physiology education and, in particular, the impact that technology promises for the future of teaching, learning, and assessment.

WHAT IS THE FUTURE OF PROBLEM-BASED LEARNING IN MEDICAL EDUCATION? S12

W. R. Galey

This article describes attempts to integrate problem-based learning with lecture-based curricula and considers opportunities for its expansion in medical education.

A PROBLEM-BASED LEARNING COURSE IN PHYSIOLOGY FOR UNDERGRADUATE AND GRADUATE BASIC SCIENCE STUDENTS S16

S. Mierson

The author outlines a two-semester problem-based learning sequence in organ-systems physiology.

INVOLVING STUDENTS IN EXPERIMENTAL DESIGN: THREE APPROACHES S28

A. P. McNeal, D. U. Silverthorn, and D. B. Stratton

The authors present three different approaches for teaching students about the process of science in laboratory settings.

DEFINING THE BOUNDARIES OF PHYSIOLOGICAL UNDERSTANDING: THE BENCHMARKS CURRICULUM MODEL S35

D. E. Lemons and J. G. Griswold

A model for setting benchmarks with an evolving approach to curriculum development was used by the authors to create an anatomy and physiology curriculum.

A CELEBRATION OF THE CENTENNIAL OF THE *AMERICAN JOURNAL OF PHYSIOLOGY* (CONTINUED)

THE ROLE OF A SCIENTIFIC SOCIETY IN PHYSIOLOGY EDUCATION: CURRENT AND FUTURE PERSPECTIVES S46

M. L. Matyas

APS programs will foster excellence in physiology education and support teaching needs by initiating on-line programs, resources, and communications.

THE FUTURE OF TEACHING PHYSIOLOGY: AN INTERNATIONAL VIEWPOINT S53

A. J. Sefton

The author raises many questions regarding national and international differences in the discipline of physiology and in the challenges of designing and teaching programs.

ARTICLES

INNOVATIONS AND IDEAS

EXPERIMENT DEMONSTRATING SKELETAL MUSCLE BIOMECHANICS S59

S. E. DiCarlo, E. Sipe, J. P. Layshock, and S. Varyani

Students act as both investigators and subjects in this interactive laboratory experience that requires only simple supplies found in any school.

MEASUREMENT OF HUMAN NASAL POTENTIAL DIFFERENCE TO TEACH THE THEORY OF TRANSEPITHELIAL FLUID TRANSPORT S72

U. Kersting, A. Schwab, and A. Hebestreit

Students measure the transepithelial potential difference of the respiratory mucosa in their own noses. They relate basic principles of fluid transport to their observations of the effects of activators and inhibitors on ion channel activities.

EDUCATIONAL CARD GAMES FOR UNDERSTANDING GASTROINTESTINAL PHYSIOLOGY S78

C. M. Odenweller, C. T. Hsu, and S. E. DiCarlo

The authors describe two creative games that engage students in active, collaborative learning. This enjoyable activity enhances students' abilities to apply and synthesize information from lectures and textbooks.

PULMONARY CIRCULATION DEMONSTRATION USING AN ISOLATED RAT LUNG MODEL S85

T. C. Resta, M. R. Eichinger, R. D. Russ, and B. R. Walker

This laboratory exercise effectively illustrates basic concepts typically taught in a graduate physiology curriculum.

TABLE OF CONTENTS

ARTICLES (CONTINUED)

IT'S A LONG WAY TO MULTIMEDIA: AN ACCOUNT OF 18 YEARS OF PURSUING A NEW MEDIA PROJECT IN PHYSIOLOGY S96

W. Wiemer

A multimedia system has been extensively field tested and applied as a common source for all kinds of materials used in teaching physiology to medical tudents.

EDUCATIONAL EXPERIMENTS

ASSESSING PREBACCALAUREATE HUMAN PHYSIOLOGY COURSES S106

V. L. McCleary

This demographic study of U.S. and Canadian schools describes variables such as class size and frequency of offerings. The results reveal some deficiencies in evaluation of the courses.

APS REFRESHER COURSE REPORT

S114

This section, jointly edited by V. L. Brooks and A. J. Vander, presents poster abstracts and articles generated from the APS course presented at EB'98.

COLUMNS

ILLUMINATIONS

S246

Bright ideas for demonstrating isovolumic contraction of cardiac chambers using a simple model.

PHYSIOLOGISTS' FORUM

S247

A reader relates childrens' responses to their first exposure to physiology, and a physiologist reports on the development of physiology education in the Czech Republic.

BOOKSHELF AND COMPUTER

S250

Review of a memoir by Knut Schmidt-Nielsen.